

ILLEGIB

Approved For Release 2001/03/03 : CIA-RDP78T05439A000400370020-9

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TCS #1966/65
PID/ABCB 45/65
23 February 1965
Copy # _____

MEMORANDUM FOR: Chief, Nuclear Energy Division, OSI

25X1A

ATTENTION: [REDACTED] SNMB/NED

THROUGH: Chief, Requirements Branch, Reconnaissance Group, CGS

FROM: Chief, Photographic Intelligence Division, CIA

SUBJECT: Measurement of Ice-free Areas at the
Tomsk Atomic Energy Complex, USSR

REFERENCES: Requirement No. C-SI5-82,167 Supplement 1
CIA Project No. 30209-5

1. Measurements of areas of melted ice on the Tom River downstream from the Tomsk AE Complex was requested in the referenced requirement. Winter coverage by various KEYHOLE missions was specified for comparison.

25X1D

2. The largest area affected by the heat dissipation was found on the latest photographic coverage, [REDACTED] the Tom River was melted downstream for approximately 26 nautical miles (nm). This mission served as a base for comparing the ice-free areas of previous missions which were complicated by varying degrees of melting and freezing. The flow within channels remained fairly consistent for all missions. A secondary ice-free area was usually present at the juncture of the Tom with a channel of the Ob River. In all cases, both areas were considered in the total ice-free measurements.

25X1D

3. Eleven 7X enlargements are enclosed which represent the effects of the hot water discharge to the Tom River from all sources within the Tomsk AE Complex. These photographic prints are from [REDACTED] different KEYHOLE missions. The enclosed overlays are meant solely as aids in following the breakdown of frozen and melted areas. In some cases, areas of thin ice may be included as part of an ice-free area because of flow below the ice. An additional print of [REDACTED] covering the city of Tomsk and its power plant is enclosed for comparison of smoke trails with those present at the AE complex (as requested verbally). 25X1D

25X1D

4. The lead from the AE complex to the Tom River is designated as the pre-cooler section. This ice-free area was calculated once; it remained fairly constant with each coverage except when a portion of the lake from the reactor lead appeared frozen on the [REDACTED] photography. This is reflected in the smaller ice-free area on the Tom River.

Declass/Review by NIMA/DOD

The pre-cooler section was subdivided and measured as follows:

Pre-Cooler Section		Area (In Acres)	
25X9	Trench canal from reactor areas		18
25X9	Reservoir lake	42*	
	Lake portion from reactor areas	23	
	Lake proper	54	119
	Stream effluent		28
	Total Ice-free area		165

25X1D * Approximately 28 acres frozen on [REDACTED]

5. The areas on the Tom River were measured to the farthest point where evidence of melting and refreezing was apparent on photography. The total areas for each mission are divided into ice-free and refrozen areas as follows:

		<u>Tom River Section</u>		<u>Remarks</u>
		<u>Area (In Acres)</u>		
<u>Mission/Date</u>		<u>Ice-Free</u>	<u>Frozen/Total</u>	
25X1D		4182	157 4339	Largest ice-free area seen to date. Thin ice in frozen zones.
		3211	739 3950	An apparent recent snowfall masks refrozen areas on this coverage. These areas can barely be traced on the direct positives of the film, & probably extends a greater distance than shown.
		3195	1146 4341	More zones of freezing are readily apparent although the total area compares to
		1346	805 2151	The effluent lines from the dual purpose reactors are cold during these missions. This may account partially for the reduced ice-free area.
		1338	818 2156	
		2610	1184 3794	None
				25X1D

25X1D

NOTE: Acreage of individual ice-free and frozen areas are shown on the overlays where such differences occurred.

TOP SECRET

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Page 3

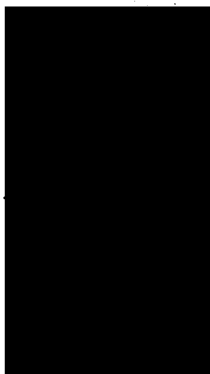
25X1D

6. All acreage computations were made from measurements with a planimeter by the CIA/PID Project Analyst. They should be considered as approximate because of changing scale. Scale was based on previous measurements at the chemical separation area. For record purposes the scale used on the 7X print from Mission [REDACTED] was approximately 4,200 feet to the inch. A request for mensuration of the same data by the NPIC Technical Intelligence Division was submitted 28 January 1965. When this is compiled, it will be forwarded by separate memorandum.

7. Additional information requested verbally on the evidence of smoke from the power plant stacks and vapor trails from the cooling towers is as follows:

Mission(s)

25X1D



Cooling Towers

One and probably both banks of cooling towers are on. Vapor trails mask the older towers.
Both banks of cooling towers on.
Both banks of cooling towers off.
Only the older bank of cooling towers on.

Power Plant Stacks

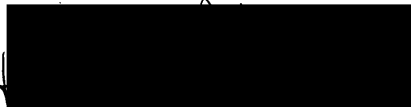
Indeterminable because of wind direction.
One stack from the old section; two stacks from the new section are smoking.
Three stacks from the old section; two stacks from the new section are smoking.
One stack from the old section, two stacks from the new section are smoking.

25X1A

8. The photo analyst on this project was [REDACTED] who may be contacted on extension 2317 should you have further questions.

9. This memorandum with enclosures is sent in partial response to the referenced requirement. When the NPIC/TID measurements are forwarded, the project will be complete.

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Enclosures:

CIA/PID/ABCB/P-108 thru 119/65
(Total of 12 Annotated Photo Enlargements)



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TOP SECRET RUFF



TCS 1966/65
CIA/PID/ABCB/P-107/65

25X1D

TOMSK AE COMPLEX, USSR
PART 2

TOP SECRET RUFF

TOP SECRET RUFF



TCS 1966/65
CIA/PID/ABCP/P-109/65

25X1D

TOMSK AE COMPLEX, USSR
PART 2

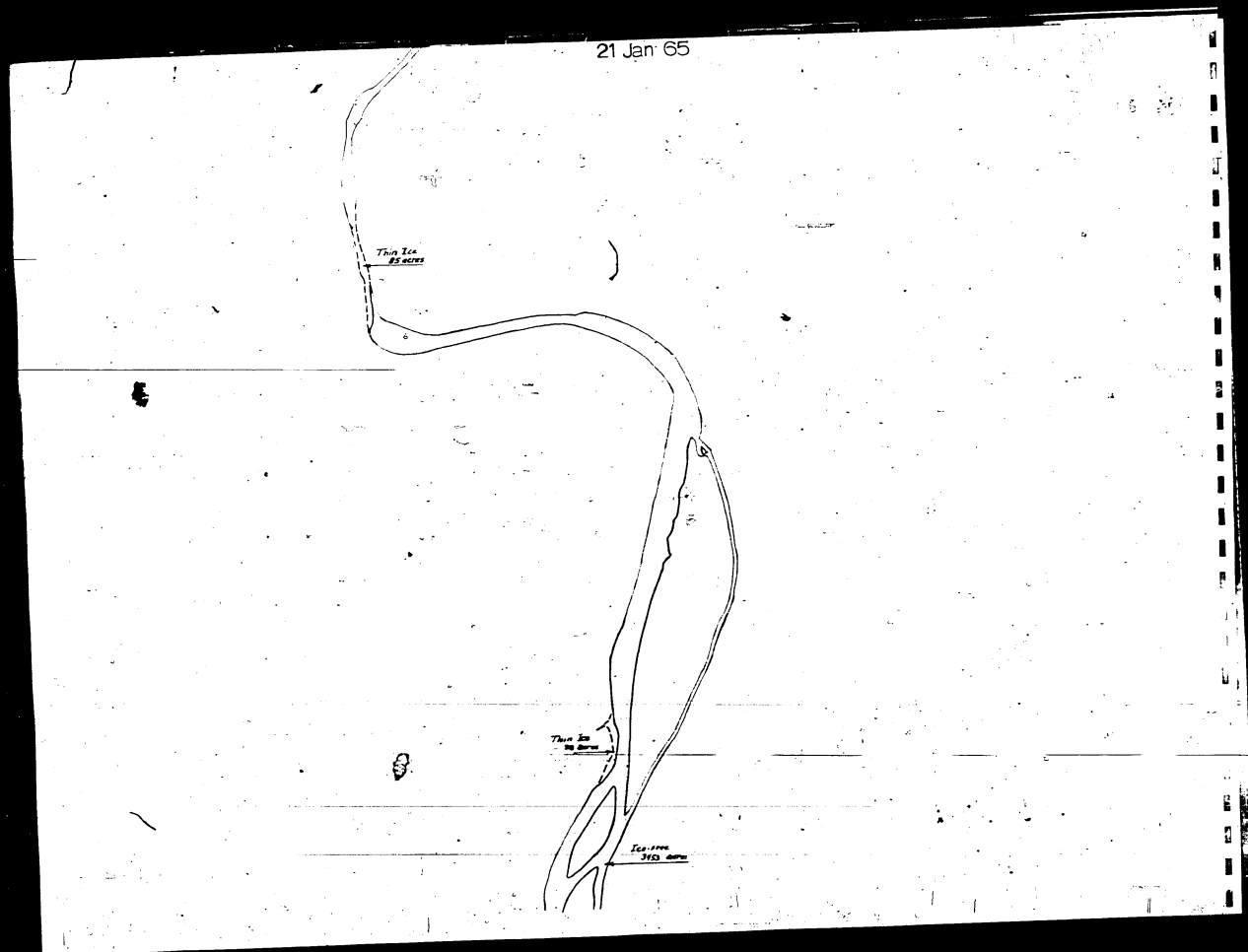
TOP SECRET RUFF

21 Jan 65

Thin Ice
25 miles

Thin Ice
25 miles

Ice-free
3100 hours



TOP SECRET RUFF

25X1D

TOMSK AE COMPLEX, USSR
PART 3

TCS 1966/65
CIA/PID/ABCB/P-110/65

25X1D

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TOMSK AE COMPLEX, USSR
PART 4

25X1D

TOP SECRET RUFF

TOP SECRET RUFF



35X1D

TOMSK AE COMPLEX, USSR
PART 4

TOP SECRET RUFF

7X
TCS 1966/65
CIA/PID/ABCB/P-III/65

TOP SECRET RUFG

25X1D
25X1D

TOMSK AE COMPLEX, USSR
PART I

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TOP SECRET RUFF

25X1D

TOMSK AE COMPLEX, USSR
PART 2

25X1D

TCS 1966/65
CIA/PID/ABC/P-113/65

TOP SECRET RUFF



TOP SECRET RUFF

TOMSK AE COMPLEX, USSR
PART 2

25X1D 25X1D

TCS 1966/65
CIA/PID/ABC/P-113/65

TOP SECRET RUFF

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ALPH 10/10/65 105 0145

TOMSK AE COMPLEX, USSR
PART I

TCS 1966/65
CIA/PID/ABC/P/14/65

25X1D

25X1D

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25X1D
TOP SECRET RUFF

25X1D



TOMSK AE COMPLEX, USSR
PART 2

TCS 1966/65
CIA/PID/ABC/P-115/65

TOP SECRET RUFF

25X1D

TOP SECRET RUFF

25X1D

IN AFTER DARKNESS JUL 20/65



TOMSK AE COMPLEX, USSR
PART 2

TCS 1969/65
CIA/PID/ABC/P-115/65

TOP SECRET RUFF

TOP SECRET RUFF

25X1D

TOMSK AE COMPLEX, USSR
PART 1

25X1D

FROZEN

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TOP SECRET RUFF

25X1D

TOMSK AE COMPLEX, USSR
PART I

TCS, 1966/65
CIA/PID/ABCB/P-118/65

25X1D

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TOP SECRET RUFF

25X1D

TOMSK AE COMPLEX, USSR
PART 2



TCS-1966/65
C/A/P/D/ABCB/P-119/65

25X1D

TOP SECRET RUFF



GRAPHIC ENCLOSURES TO:
TCS 1966/65 PID/ABCB 45/65
23 February 1965
CIA/PID/ABCB/P-108/65 thru
CIA/PID/ABCB/P-119/65

WATER DISCHARGE STUDY

**ATOMIC ENERGY COMPLEX
TOMSK - USSR**